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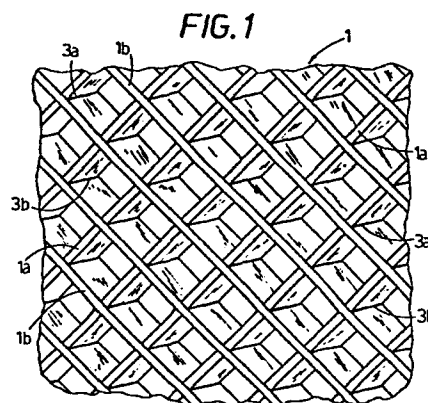
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54 A drum having a side carrying wall of a latticed structure for machines for the manufacture of paper, paper-board, asbestos cement or the like.

57 A drum having a carrying side wall of a latticed structure, to be used as a forming or suction drum in the machines for the manufacture of paper, paper-board, asbestos cement and the like, and which consists of two heads (2 or 2a) between which is mounted a peripheral, cylindrical carrying wall (1) constituted of two pluralities of small bars (1a, 1b) crossing to each other and which extend helically with the same pitch, but right-hand and left-hand respectively and equally spaced apart from each other so as to form a reticular structure with passages quadrangular in cross section, the bars (1a, 1b) being restrained with each other in their cross point. The heads (2 or 2a) are provided with axial orifices through which washing pipes (8, 8a; 8A) and optionally suction pipes can freely pass through the revolving drum.



A DRUM HAVING A SIDE CARRYING WALL OF A LATTICED
STRUCTURE FOR MACHINES FOR THE MANUFACTURE OF PAPER,
PAPER-BOARD, ASBESTOS CEMENT OR THE LIKE.

The present invention relates to a drum adapted to be
used as a forming or suction drum in machines for the
manufacture of paper, paper-board, asbestos cement or
the like. This drum has a cylindrical carrying side
5 wall of a latticed structure, which is obtained by
means of two pluralities of small bars extending
helically right-hand and left-hand respectively,
crossing with other and restrained in their cross
points.

10

Drums are already known which have perforated side wall
and which are used as forming or suction drums in the
machines for the manufacture of a web of paper, paper-
board, asbestos cement or the like, and which will be
15 formed around said drum which is covered by a wire
cloth underneath of which a fabric undercloth is placed
and through which passes the water separated from the
employed mixture, which latter being compressed under
the action of one or more mechanized pressure
20 cylinders.

The mixture can be applied on said cloths by means of a
distribution box or it can be collected by means of the
side wall of the drum which is partially plunged into a
tank which contains the mixture.

Said known and broadly used drums are constituted of a pair of heads mounted on a longitudinal shaft and between which and on said shaft, also a plurality of arm dials are keyed which are equally spaced apart from
5 each other respectively supporting a peripheral rim.

Said heads and the rims, and or the arms dials support longitudinal bars which are equally angularly spaced apart from each other so as to form a drum, having a perforated side wall, on which the wire cloth and the
10 fabric cloth are applied, on which the web of paper or the like will be obtained under the action of the pressure applied to said web by means of the pressure cylinders with the interposition of a continuous felt band. Thus the drum is caused to rotate by the
15 mechanized rollers by means of its shaft said drum freely rotate into support sleeves.

In order to increase the efficiency of the machine, attempts have been made so as to increase the drum peripheral speed, but it has been found that when said
20 speed is increased, the possibility to obtain a good formation of the sheet of paper or the like decreases, owing to the tendency that the fibrous particles of the mixture present, of moving away from the outer wire cloth under the effect of the centrifugal force so that
25 by means of the known drum, one can work only with peripheral speeds not higher than 2m/second.

In order to overcome said inconvenience and to improve the efficiency, provision has been made that perforated

pipes are mounted in the inside of the drums of the
aforementioned type; said pipes are connected to a
suction source so as to create, through the perforated
wall of the drum and the cloths placed thereupon, a
5 suction effect capable of counter-balancing the centri-
fugal force. But this solution has the inconvenience to
be complicated and therefore expensive, since each
suction pipe or bar, which in the known drums had to be
made integral with the drum, as a result of the
10 presence of the shaft and of the interposed bar dials
thereof, was able to operate only on a predetermined
sector of the drum, which corresponds at most to the
30-40% of the whole side surface of the drum. Therefore
the number if the suction pipes had to be considerable
15 and complicated connections of said pipes to the
suction source were required.

An other important problem, concerning these drums
consists of the fact that it is necessary to be able to
carry out an efficient cleaning, in order to remove the
20 residues of the mixture materials from the inside of
the drums, residues which are drawn together with the
drainage water and which can deposit on the external
cloths or on the inner parts of the drum.

Such a cleaning system in the known drums could be only
25 performed, acting from the outside, and in a little
efficient manner, by employing pressurized washing
jets, directed tangentially or nearly tangentially with
respect to the side surface of the drum. This problem
becomes more important in the case of the manufacture

of webs or plates of asbestos cement, on account of the specific characteristics of such a mixture, consisting of asbestos fibers and cement which is used as binding medium. The very small particles of the cement powder
5 obstruct the cloths so that it results that a bad and irregular formation of the layers which compose the web takes place, so that at frequent time-intervals radical washings of the drums with a suitable cleaning solution become necessary. For such a purpose the drums have to
10 be disassembled and transported to the repair shop for carrying out complete cleaning operations.

The purpose of the present invention is thus that of overcoming the inconveniences of the known drums which are used in the machines for the manufacture of the
15 paper, paper-board asbestos cement and the like.

For such a purpose the invention provides to realize a drum which can be used, as forming drum or as suction drum, and which comprises two heads provided with coaxial orifices and between which is fixed a
20 peripheral cylindrical carrying wall of a latticed structure. To said orifices tubular members are made integral which serve as means for supporting the drum and which also permit the free rotation of this latter about its axis, while through said orifices perforated
25 washing pipes can be inserted in the inside of the drum, said pipes supplying a pressurized liquid fed from an external source. On account of the absence of the drum shaft as well as of the inner supports for the annular rims that there are in the known drums, said

pipes can be now stationary or can swing about a fixed axis. In practice also one washing pipe can be sufficient in order to attain an optimal cleaning, since said pipe can be mounted near the lower portion 5 of the revolving drum; said pipe is provided with radial nozzles for the delivery of the washing liquid. The peripheral carrying wall of this drum is obtained by an interconnection of two pluralities of small bars extending helically right-hand and left-hand respecti 10 vely and which are uniformly spaced apart from each other and are restrained to each other in their cross points, owing to the presence of transversal slots, having a length substantially equal to the half width of each bar at both its ends said wall is connected to 15 the two heads and is capable of bearing all the involved stresses, without requiring that in the inside of the drum any supporting means for said wall have to be provided.

As a consequence it does not need any provision of an 20 axial shaft for supporting the drum: furthermore the heads selves are shaped so as to form hollow supporting means: further there is no more any bar dial as in the conventional drums so that the inner cavity of the drums is entirely free so that one or more washing 25 spray pipes can be inserted which pass through the orifices arranged in the heads, and said pipes can be stationary or can swing about a fixed axis of course with an equal simplicity, stationary suction pipes could be mounted for the above mentioned purposes. On

account of the fact that either each spray pipes or
each suction pipe is stationary or swinging about a
fixed axis, said pipe can be placed in the most
convenient position so as to be able to act on each
5 drum sector, when said sector passes in the front of
said pipe. It results therefrom that in practice only
one spray pipe could be mounted preferably facing the
lower inner portion of the drums or also optionally a
suction pipe, which in this case has to be mounted in
10 close proximity of the sector about which the formation
of the web of paper and the like takes place.

The so obtained latticed wall is such that the area of
orifices or passages thereof will be equal to about 70-
75% of the total side area of said side wall of the
15 drums. Further the configuration of the wall structure
is such as to present characteristics of strength which
are substantially uniform in each direction so that the
mixture will be distributed and compressed with a
complete uniformity along said wall and that permits to
20 attain better results as well as to enable the drum to
work at speeds which do not only reach 2m/sec but are
also higher than this latter, by means of the insertion
in the inside of the drum of any sufficient number of
suction devices.

25 These and other characteristics and advantages of the
present invention become readily apparent in the
following description of two embodiments thereof,
reference being made to the accompanying drawings, in
which:

Figure 1 is a perspective view of a portion of the latticed wall of a drum, when developed in a plan;

Figure 2 is a diagrammatic side view with a partial axial section of a drum, in the inside of which is mounted a washing pipe and in which, for clarity of representation, the bars are shown as in rectilinear form instead of in a helical form;

10 Figure 3 is an enlarged view of a portion of the side latticed wall of the drum, assuming that it is developed in a plan, said portion being adjacent to one of the head rings;

15 Fig. 4 is a partial section, along line A-A of Fig. 3;

Figure 5 is an axial section of the drum according to another embodiment; and

20 Figure 6 is the view of the drums of Figure 5, taken from one of its heads.

According to the embodiment shown in Figures 1 to 4, the drum comprises two heads generally marked 2, between which a peripherally cylindrical carrying wall is mounted which is generally marked 1. Such a wall 1 consists of a strong latticed structure, which is constituted, in combination, of two pluralities 1a and

lb of small metal bars, fixed at their ends along the periphery of the heads 2 and which extend helically, right-hand and left-hand respectively, with the same pitch and which are angularly spaced apart from each other, in such a manner as to form a latticed structure, through which are defined substantially radial passages each having a quadrangular cross section. The bars 1a, 1b cross each others and are mutually restrained in their cross points by means of transversal slots 3a and 3b having a length substantially equal to the half width of each bar 1a, 1b; slots 3a are cut through the outer edges of the bars 1a and the slots 3b are cut through the inner edges of the bars 1b (Figure 1). The restrained connection between the bars 1a, 1b can be improved by weldings applied along the joint zones. Thus a cylindrical latticed side wall 1 is created which is supported at their ends only by the two heads 2. These latter are constituted of peripheral rings generally marked 4 supported by a disc-like member 5 which axially extends outwardly with a hollow hub 5a; said hubs define inner coaxial openings. Each ring 4 has a longitudinal cylindrical flange extending towards the wall 1 respectively (Figures 2 to 4) which has an outer shoulder 4b of a depth lesser than the thickness of the cylindrical wall 1. On the cylindrical bottom surface of the shoulder 4a grooves 6 are arranged so shaped as to be able to receive the inner edges of the respective ends of the bars 1a, 1b in their use position. The

depth of the grooves 6 with the addition of that of the shoulder 4b is such to bring the outer edges of the bars 1a, 1b to come into alignment with the outer cylindrical side surface 4c of the rings 4. According to the shown embodiment each ring 4 has an annular shoulder 4b at its outer surface, which is designed to receive the radial peripheral flange 5b of the head disc 5 which is fixed to the respective ring 4, in any disassemblable manner, by means of screws, for instance 10 inserted in the holes 17 (Figures 2 to 4).

Owing to the particular configuration of the drum constructed according to the invention neither the longitudinal shaft supporting the drum nor any inner structure for the side wall 1 are now present, since 15 the drum is supported, in a freely revolving manner, by means of the hollow hubs 5a housed in fixed tubular supporting members 7. The inner cavity of the drum is entirely free and accessible through the inner cavities of the hubs 5a through which can be inserted at least a 20 pipe 8 which can be a stationary pipe or a pipe swinging about a fixed axis and which can have a two-elbowed configuration in order that said pipe can have an inner section 8a which can be positioned in close proximity of the inner surface of the wall 1, where 25 said pipe section is provided with radial holes or nozzles 9, directed against the wall 1.

Each pipe 8, 8a will be connected at least at one of its ends, which the interposition of a control valve 10, to a feeding source of a pressurized washing liquid

which may be water that could contain also any additive adapted to promote the removal of the deposits formed in the inside of the drum or on the cloths which are provided for filtering the draining water which
5 passes through the wall 1. Thus by employing the improved drum in question, an efficient washing of the inner space of the drum can be attained by means of very strong pressurized liquid jets which passing through the latticed wall 1 and the filtering cloths
10 (not shown), maintain the drum and the cloths placed there about in a condition of perfect efficiency. This advantage is of vital importance, in particular, in the machines for the manufacture of the asbestos cement products.

15

Of course, besides the insertion in the inside of the drum of at least one washing pipe, preferably mounted in close proximity of the lower portion of the inner surface of the drum in the inside of this latter one or
20 more perforated suction pipes (not shown) can be mounted in an equally simple manner. Also these latter pipes will be stationary so that one or more can be mounted only in that zone before which successively passes that sector of the drum 1 through which has to
25 be created a suction action adapted to compensate for the effect of the centrifugal force, in such a manner to permit to increase the operative peripheral speed of the drum in order to increase the efficiency of the machine. On account of the fact that the suction pipe

is stationary, in general it will be sufficient to employ only one pipe in order to obtain a satisfactory suction effect. Provision is made that the drum is drawn to rotate by mechanized pressure rollers, but, of course, nothing prevents from employing to transmit a revolving movement also directly to the drum itself by the provision of mounting on one of the hubs 5a; or one of the rings 4, a toothed crown that can mesh with a train of gears for the motion transmission to the drum.

10 Figures 5 and 6 show a second embodiment wherein the heads 2a consist of peripheral rings 4 identical to those which have been shown and described in the first embodiment, while, instead of the discs, simple shaped rings, are provided generally indicated 12. Each ring 12 is provided with an inner radial flange 12a designated to be housed in the annular facing shoulder 4d of the respective ring so as to form a cylindrical band 12b designated to form the sliding and guiding race for at least two idle pulleys 13 mounted on small fixed longitudinal shafts 14. In the embodiment, shown in Figures 5 and 6, only two pulleys 13 are provided, which are mounted near the lower part of the drum, but nothing prevents that at least one or more guiding pulley be provided also in other positions.

25 In this embodiment orifices are thus created in the heads 2a of this drum, which are so large that the advantage is obtained that the washing pipes 8A can extend rectilinearly as well as the optional suction pipes can be also rectilinear.

In addition through said wide orifices at the heads 2a of the drum periodical mechanical operations of inner cleaning can be carried out, without having to disassemble the drum, and to employ implements such as 5 brushes, swabs and the like.

CLAIMS

1. A drum consisting of two heads between which is mounted a peripheral side wall provided with passages to be used as a forming or suction drum in machines for the manufacture of paper, paper-board, asbestos cement
5 and the like, characterized by the fact that between the two heads (2 or 2a) a peripheral carrying wall (1) of a latticed structure is mounted, which is formed by means of two pluralities of small bars (1a, 1b) crossing with each other and which extend helically right-hand
10 and left-hand respectively, with the same pitch and which are spaced apart from each other at equal distances so as to form a latticed structure defining substantially radial passages of a quadrangular cross section, said bars being connected in their cross
15 points in a restrained manner, while the heads (2 or 2a) are provided with coaxial orifices, about which are arranged means to guide and support the drum and through which enter into the drum at least one spray washing pipe (8, 8a; 8A) and optionally one or more
20 suction pipes, all said pipes having fixed axes.

2. A drum according to claim 1, wherein the heads (2 or 2a) comprise peripheral rings (4), each provided with a longitudinal cylindrical flange (4a) extending towards the wall (1), and on the outer surface of which an
25 annular shoulder (4b) is arranged, on the bottom surface of which grooves (6) are provided adapted to

receive the inner edge of the ends of the small bars (1a, 1b), the radial depth of said shoulder (4b) added to that of the grooves (6) being such as to permit that the outer edges of the bars (1a, 1b) are put in
5 alignment with the cylindrical outer side surface of the respective ring (4).

3. A drum according to claim 1, wherein, in order to restrain the bars (1a, 1b) to each other, in the bars (1a) slots (3a) are cut through their outer edge, while
10 in the bars (1b) slots (3b) are cut through their inner edge, said slots (3a, 3b) having a length equal to about the half width of the bars (1a, 1b).

4. A drum according to claims 1 and 2, wherein each head (2) consists of a peripheral ring (4) connected in
15 disassemblable manner to a disc (5), which extends outwardly with a hollow hub (5a) provided with a large axial orifice.

5. A drum according to claims 1 and 2, wherein each head (2a) consists of a peripheral ring (4) and of an
20 inner ring (12) which extends axially outwards with regard to the ring (4) so as to form an annular guiding race (12b) for the rolling of pulleys (13) which carry the drum and which are mounted about fixed shaft, the axes of which are parallel to that of the drum.

FIG. 3

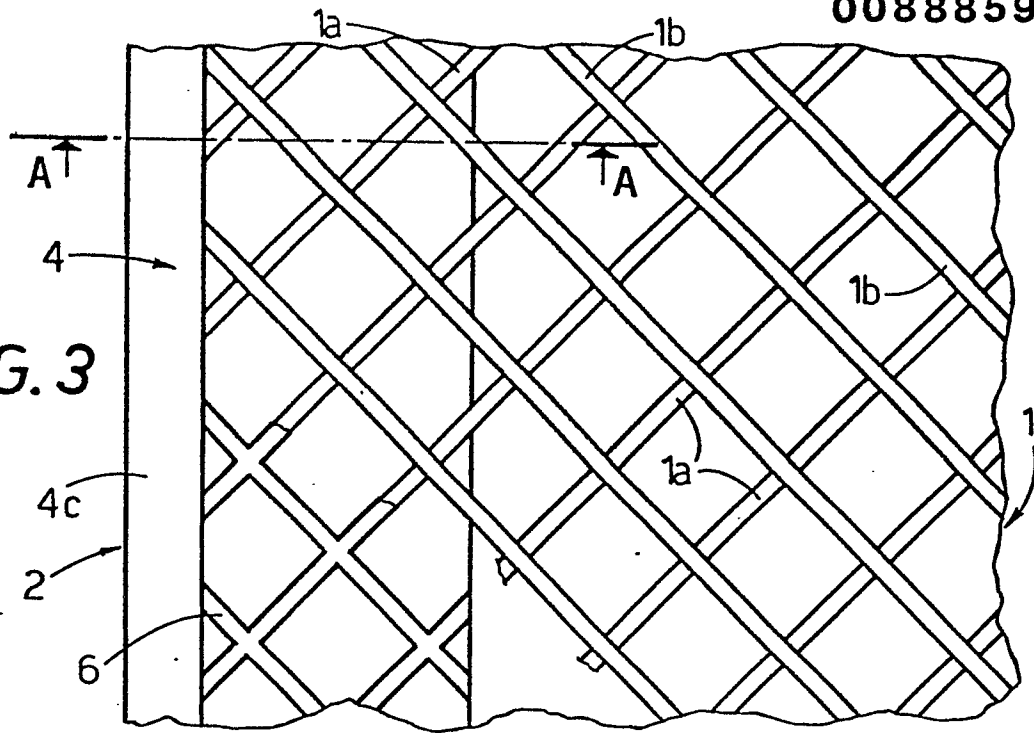


FIG. 6

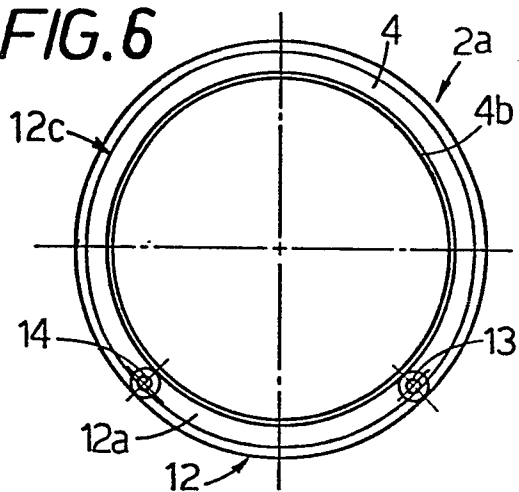


FIG. 4

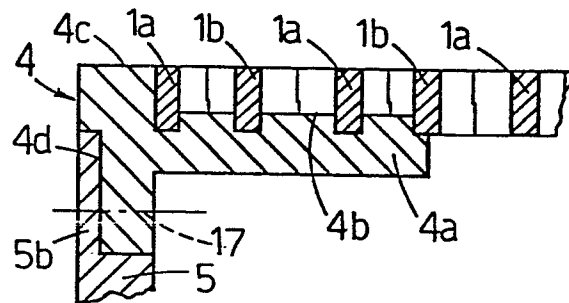


FIG. 5

